resulting in a less uniform heating than is secured in the ordinary design of the Cowper stove. *M*

In the model (Fig. 61) of the Cowper stove the cross-section was intentionally made with checker openings of several sizes, in order to show, in a graphic manner, that such complications of the checkerwork are useless.

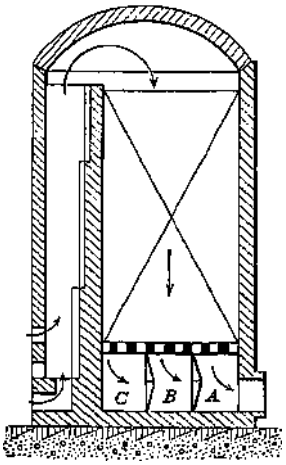

FIG. 64.

The hot-blast stove patented by J. Z. Stephenson and J. Evans (Fig. 64) has never come into any extended use. In order to insure a uniform distribution of the hot gases through the checkerwork the inventors resorted to a series of complicated walls and dampers in the chamber below the checkers. The discussion carried on in the technical journals, between Luhrmann and these inventors, is mentioned merely for its historic interest. Luhrmann contended that the largest portion of the waste gases passed through the section above *A* and the smallest portion through the section above *C.* The inventors claimed the contrary. This discussion made it very clearly apparent that the ideas of contemporary constructors, in regard to the circulation of the gases, were

confused to a most remarkable extent.

The quarrel was finally settled to the satisfaction of both parties.

In the Cowper stove the work of the checkerwork is inherently" uniform, and all walls and dampers below the checkers, for the purpose of distributing the gases, are superfluous. (2>

(1) This design will give less frictional resistance in the large openings than in the small; accordingly, the waste gases from the large passes will be hotter than the gases from the smaller passes.

<2) In the *Revue de M6tallurgie,* for February, 1913, p. 362, can be found the designs of a Cowper stove built for the furnace at Caen, France, and provided with five chimney valves connecting the chamber below the checkerwork with a bustle pipe outside the stove. The idea was, of course, that this would conduce to the uniform distribution of the gases heating the checkerwork.

This idea, in many ways, resembles that of Stephenson and Evans, mentioned above. The multiplication of the chimney valves is useless. It would be sufficient to replace them by a single valve whose dimensions may be computed by Yesmann's formula.